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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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COCHRAN FREUND & YOUNG LLC
3555 STANFORD ROAD
SUITE 230
FORT COLLINS, CO 80525

EXAMINER

YANG, RYAN R

ART UNIT	PAPER NUMBER
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2672

DATE MAILED: 07/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/747,678

Applicant(s)

KEHRLE ET AL.

Examiner

Ryan R Yang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-10 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

DETAILED ACTION

1. Claims 1-10 are pending in this application. Claims 1 and 9 are independent claims. This action is non-final.
2. This application claims foreign priority dated 12/24/1999.
3. The present title of the invention is "Method for interactive construction of virtual 3D circuit models".

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claim 9 is rejected under 35 U.S.C. 102(e) as being anticipated by Mukouchi et al. (6,104,403).
6. Re claim 9, Mukouchi discloses a system for changing a relative position and/or orientation of two components of a virtual model displayed on a screen, said system comprising:

a storing apparatus that includes data defining a virtual model displayed on at least one screen (Figure 1- part storage unit 14 for storing part models 16),

an input device that enables an user to input commands to effect a selection of components of the model displayed on said screen whose relative position and orientation is to be changed (Figure 49 is a work screen allows assembling processing);

a processing apparatus that changes the relative position and orientation of the selected components in accordance with said input commands (Figure 21- part 112 and 114; "Figure 21 illustrates assembling processing in cases where a part model is provided with two-points junction reference data. In the world coordinate space there are arranged for instance a part model 112 of a door frame and a par model 114 of a door", column 15, line 11-15) and that provides on said screen a modified virtual model incorporating the change in relative position and orientation of the selected components ("The execution of the assembling processing of such part models 112 and 114 would result in a rearrangement in which as shown in Figure 22 the junction reference points 116 and 120 are aligned with each other while simultaneously the junction reference point 122 is aligned with the junction reference point 118", column 15, line 18-24) and that provides an indication on said screen of a remaining degrees of freedom of said selected components after the change has been made ("Figure 24 is an explanatory diagram of the degree of freedom between assembling part models having two points junction reference data", column 6, line 11-13; "FIG. 24 illustrates an assembly model appearing after attaching the door part model 114 to the door frame part model 112 at the two junction reference points", column 15, line 33-35. Since the door is hinged after movements, it shows lesser degree of freedom of movement.)

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mukouchi et al. (6,104,403).

9. Re claim 1, Mukouchi et al., hereinafter Mukouchi, disclose a method of changing the relative position and/or orientation of two components of a virtual model displayed on a screen, the method comprising:

selecting components whose relative position and orientation is to be changed (Figure 21 part 112 and 114; "Figure 21 illustrates assembling processing in cases where a part model is provided with two-points junction reference data. In the world coordinate space there are arranged for instance a part model 112 of a door frame and a par model 114 of a door", column 15, line 11-15);

defining a change to be made ("The execution of the assembling processing of such part models 112 and 114 would result in a rearrangement in which as shown in Figure 22 the junction reference points 116 and 120 are aligned with each other while simultaneously the junction reference point 122 is aligned with the junction reference point 118", column 15, line 18-24); and

calculating and providing on the screen an indication of a remaining degrees of freedom of the components after the change has been made (Figure 19 depicts the calculation steps; "Figure 24 is an explanatory diagram of the degree of freedom between assembling part models having two points junction reference data", column 6, line 11-13; "FIG. 24 illustrates an assembly model appearing after attaching the door part model 114 to the door frame part model 112 at the two junction reference points", column 15, line 33-35. Since the door is hinged after movements, it shows lesser degree of freedom of movement.)

It is noted that Mukouchi does not explicitly disclose calculating for degrees of freedom, however, since Mukouchi is calculating for the movement of the model (Figure 19- S7), and the movement shows the degree of freedom (Figure 22 and 24), Mukouchi is indirectly calculating for the degree of freedom.

10. Re claim 2, Mukouchi demonstrated all the elements as applied to the rejection of independent claim 1, supra, and further discloses step of determining whether the change to be made is possible based on an existing degrees of freedom of the components and, if not, indicating this to a user (Figure 34 and 35 where the arrow is the indication; "three or more junction reference points are provided with information indicative of clockwise or counterclockwise orders (column 16, line 48-50).

11. As for claim 4, Mukouchi demonstrated all the elements as applied to the rejection of independent claim 1, supra, and further discloses the steps of

calculating degrees of freedom of the components prior to the change being made (Figure 19 depicts the calculation steps);

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determining whether the change causes a reduction in the degrees of freedom and, if so, effecting the reduction in degree of freedom and providing an indication of the reduction to a user ("Figure 24 is an explanatory diagram of the degree of freedom between assembling part models having two points junction reference data", column 6, line 11-13; "FIG. 24 illustrates an assembly model appearing after attaching the door part model 114 to the door frame part model 112 at the two junction reference points", column 15, line 33-35. Since the door is hinged after movements, it shows lesser degree of freedom of movement.)

It is noted that Mukouchi does not explicitly disclose calculating for degrees of freedom, however, since Mukouchi is calculating for the movement of the model (Figure 19- S7), and the movement shows the degree of freedom (Figure 22 and 24), Mukouchi is indirectly calculating for the degree of freedom.

11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mukouchi et al. (6,104,403) as applied to claim 1 above, and further in view of Noyama et al. (5,594,850).

Re claim 3, Mukouchi demonstrated all the elements as applied to the rejection of independent claim 1, supra, and further discloses the step of conveying information on a changed position and orientation of the components to a user on-screen, and modifying the virtual model to incorporate the change ("FIG. 24 illustrates an assembly model appearing after attaching the door part model 114 to the door frame part model 112 at the two junction reference points", column 15, line 33-35, which is the effect of changes.)

Mukouchi discloses a method of changing the relative position and/or orientation of two components of a virtual model. It is noted that Mukouchi does not explicitly disclose the step of calculating a transformation matrix for carrying out the change, however, this is known in the art as taught by Noyama et al., hereafter Noyama. Noyama discloses a method of simulating images in which a transformation matrix is calculated between a source image and a destination image (204-208 of Figure 11).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Noyama into Mukouchi because Mukouchi discloses a method of changing the relative position and/or orientation of two components of a virtual model and Noyama discloses a transformation matrix between two images can be calculated in order to facilitate the transformation.

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mukouchi et al. (6,104,403) in view of Noyama et al. (5,594,850) as applied to claim 3 above, and further in view of Kato (5,905,501).

Re claim 5, Mukouchi and Noyama demonstrated all the elements as applied to the rejection of claim 3, supra.

Mukouchi and Noyama disclose a method of changing the relative position and/or orientation of two components of a virtual model. It is noted that Mukouchi and Noyama do not explicitly disclose "the indication of the remaining degrees of freedom of the components, and an indication of the change to the position and orientation of the components is conveyed to the user by only conveying information that has changed since the change to the relative position and orientation", however, this is known in the

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art as taught by Kato. Kato discloses a method of generating an assembling view in which "all the movement information with respect to the movement of the three-dimensional body having been disassembled is retained and displayed as initial values to display screens which prompts to enter data at steps S13-S15 and it suffices to update only data to be changed", column 6, line 51-55.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Kato into Noyama and Mukouchi because Noyama and Mukouchi disclose a method of changing the relative position and/or orientation of two components of a virtual model and Kato discloses only the changed part is conveyed in order to reduce data displayed.

13. Claims 6-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mukouchi et al. (6,104,403) as applied to claim 1 above, and further in view of Bentley et al. (6,341,291).

Re claim 6, Mukouchi demonstrated all the elements as applied to the rejection of independent claim 1, supra.

Mukouchi discloses a method of changing the relative position and/or orientation of two components of a virtual model. It is noted that Mukouchi does not explicitly disclose "a plurality of screens of a plurality of users, such plurality of screens being connected to a common collaboration server, data defining said virtual model at any time being stored in said collaboration server and conveyed to all users", however, this is known in the art as taught by Bentley. Bentley discloses a computer network used in

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CAD design where a central server is used ("A plurality of client computers are bi-directionally connected to the server", Abstract, line 8-9).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Bentley into Mukouchi because Mukouchi discloses a method of changing the relative position and/or orientation of two components of a virtual model and Bentley discloses the CAD data be shared in a network environment in order to be used by a plurality of users.

14. Re claim 7, Mukouchi and Bentley demonstrated all the elements as applied to the rejection of dependent claim 6, *supra*, and Bentley further discloses the step of selecting, a lock signal is transmitted to all the users other than a user who has made the selection, and wherein said lock signal is an indication that the selected components are not available to be moved by any of said other users ("If there are unresolved conflicts, that is, components that have been modified and committed by another user and have also been changed locally, then commit is blocked", column 13, line 8-11).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Bentley into Mukouchi because Mukouchi discloses a method of changing the relative position and/or orientation of two components of a virtual model and Bentley discloses usage by other user can be blocked in order to avoid conflict.

15. Re claim 8, Mukouchi and Bentley demonstrated all the elements as applied to the rejection of dependent claim 7, *supra*.

As for lock signal is removed after the change has been made, since the lock signal is established to prevent changes by other, it is obvious the lock signal is removed after change has been made in order to prevent hanging of the system.

16. Re claim 10, Mukouchi demonstrated all the elements as applied to the rejection of independent claim 9, *supra*.

Mukouchi discloses a method of changing the relative position and/or orientation of two components of a virtual model. It is noted that Mukouchi does not explicitly disclose "a plurality of screens of a plurality of users are connected to a common collaboration server in which the virtual model and the processing apparatus are contained", however, this is known in the art as taught by Bentley. Bentley discloses a computer network used in CAD design where a central server is used ("A plurality of client computers are bi-directionally connected to the server", Abstract, line 8-9).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Bentley into Mukouchi because Mukouchi discloses a method of changing the relative position and/or orientation of two components of a virtual model and Bentley discloses the CAD data be shared in a network environment in order to be used by a plurality of users.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Inquiries

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Ryan Yang** whose telephone number is **(703) 308-6133**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Michael Razavi**, can be reached at **(703) 305-4713**.

Any response to this action should be mailed to:


Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.


Ryan Yang
June 28, 2004